

Abstract

A semiconductor multi-layered structure (1) having non-uniform quantum dots formed without requiring lattice strain is of a double hetero junction structure in which an active layer (3) has clad layers (5, 6, 16) laid on its opposite sides, wherein the clad layers are larger in forbidden band than the active layer (3), and the active layer (3) includes at least one layer of non-uniform quantum dots (2) formed without requiring lattice strain and wherein the non-uniform quantum dots in the layer (2) are composed of compound semiconductor material and different from one another in either size or material composition or both. A light emitting diode (15, 15'), a semiconductor laser diode (20) and a semiconductor light amplifier (30) are also provided, each having a semiconductor multi-layered structure (1, 1') with non-uniform quantum dots. They can emit or amplify light wide in range of wavelengths.